

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
9 September 2005 (09.09.2005)

PCT

(10) International Publication Number  
**WO 2005/082460 A1**

(51) International Patent Classification<sup>7</sup>: **A62B 7/08**,  
B01J 19/08

(21) International Application Number:  
PCT/US2005/004770

(22) International Filing Date: 15 February 2005 (15.02.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
60/545,927 20 February 2004 (20.02.2004) US

(71) Applicant and

(72) Inventor: SULLIVAN, Thomas, M. [US/US]; Sullivan &  
Company, 2655 Rand Road, Indianapolis, IN 46241 (US).

(74) Agent: BRODY, Christopher, W.; Clark & Brody, 1090  
Vermont Avenue, N.W., Suite 250, Washington, DC 20005  
(US).

(81) Designated States (unless otherwise indicated, for every  
kind of national protection available): AE, AG, AL, AM,

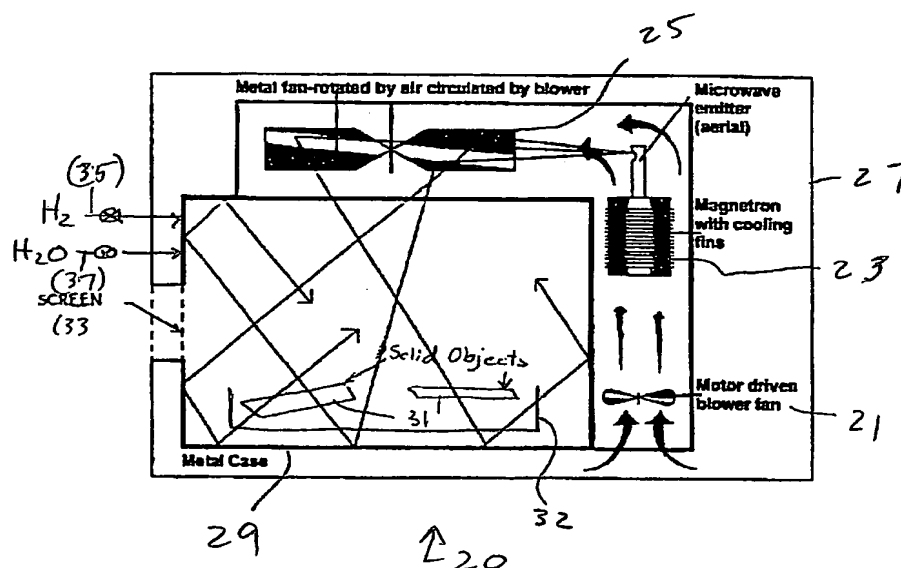
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,  
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,  
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,  
KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD,  
MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,  
PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ,  
TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA,  
ZM, ZW.

(84) Designated States (unless otherwise indicated, for every  
kind of regional protection available): ARIPO (BW, GH,  
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,  
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),  
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,  
FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO,  
SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN,  
GQ, GW, ML, MR, NE, SN, TD, TG).

Published:  
— with international search report

For two-letter codes and other abbreviations, refer to the "Guid-  
ance Notes on Codes and Abbreviations" appearing at the begin-  
ning of each regular issue of the PCT Gazette.

(54) Title: APPARATUS AND METHOD OF CLEANSING CONTAMINATED AIR USING MICROWAVE RADIATION



(57) Abstract: An air conditioning system uses microwaves to effectively destroy airborne contaminants. In one mode, air (8) is passed through a microwave-transparent tube (6) and is subjected to microwaves in the presence of one or more of water, water vapor, steam or hydrogen to cause destructive dipole polarization, electrical coupling, hydrolysis, and/or interfacial polarization of the contaminants or impurities found in the air (8). In another mode, solids or liquids are decontaminated by subjecting the objects to microwaves. Paramagnetic dust particles in the air, especially underground railway air, can also be removed using an electromagnet.